Facilities For The Manufacture Of Maple Confections

C. O. Willits[1] and Lloyd Sipple[2]

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The central sap evaporation plant operator, like all plant owners, seeks to keep overhead expenses low.

One means of accomplishing this is to have no periods when the plant stands idle since the fixed costs continue regardless of whether or not the plant is in operation. In some instances, a plant in disuse deteriorates at an even faster rate than one in operation. Since the single purpose of evaporating sap to sirup will require plant operation only a few weeks each year, it is advisable to develop other uses for the plant facilities.

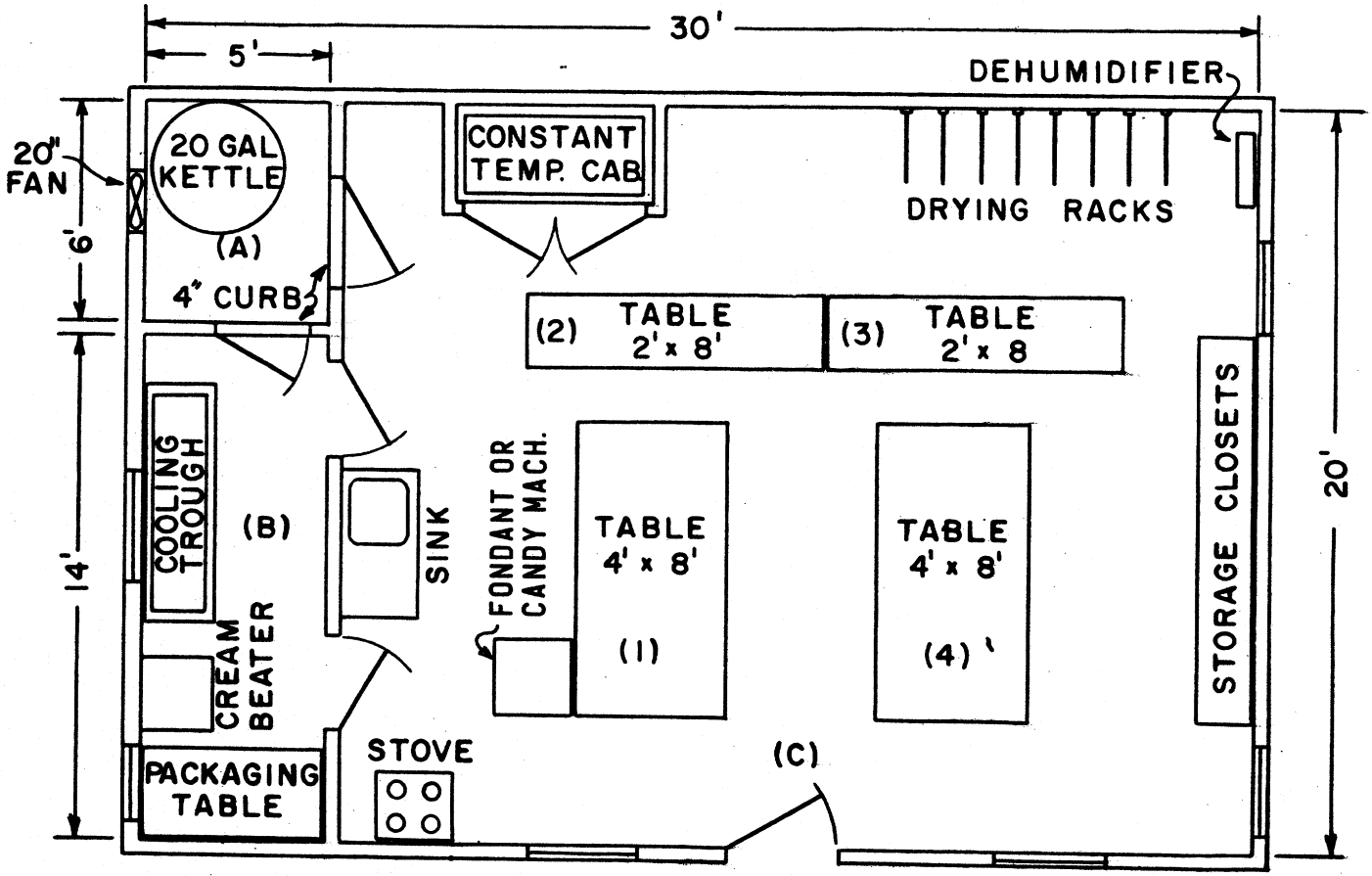
Two such uses would be (1) the after-season filtering, mixing, and packaging of the sirup made during the sap flow period, and (2) the manufacture of confections. These uses could provide for year-round operation of the plant.

The manufacture of maple confections also provides for larger economic returns for sirup. Each gallon of maple sirup will yield 8 pounds of sugar or confections. This sugar in sirup form has a value of 75¢ a pound based on $6.00 per gallon of sirup. When converted to one of the many maple confections it is worth $1.25 to $1.75 a pound, or a gain of 50¢ to $1.00 per pound. The cost of converting 75¢ sirup sugar to $1.25 to $1.75 confection sugar is relatively small, with labor being the principal expense. Central sap evaporation plant operators recognize that addition of confection manufacture to their plant will greatly increase earnings. A number of such operators have avoided this operation principally because they do not know what size facilities should be built to meet their requirement. We have been requested to supply plans which could be used as a guide in setting up a confection making facility.

In response to this, the following floor plan and flow-of-operation diagram have been prepared. This floor plan is an adaptation and combination of several such facilities now in operation. It was based on a plant with an evaporation capacity of 9,000 gallons of sirup per season. This plant currently produces more than 4 tons of confection annually and a minimum of 200 pounds per week.

The facility is divided into three areas designed as Rooms A, B, and C. (Figure 1).

Room A. This room contains the 20 gallon steam-jacketed kettle (candy cooker) which is used in the initial step of all of the different confection making processes. The room, 4' x 5', provided with a wall fan to exhaust the steam



☆ Maple Cream ☆

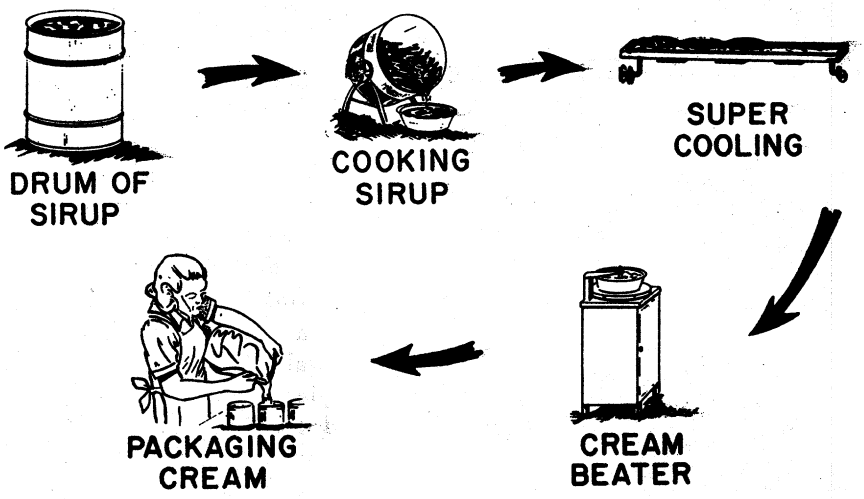


Figure 2A

from the cooking sirup and the kettle room, is separated from Room B (so that steam will be prevented from entering it). If steam were allowed to escape into Room B, the humidity would be raised too high for drying and crystal coating of the candies. The access doors to Room A have 4" high sills and the floor is all masonry with a floor drain. This permits easy washing of the kettle and the floor by hosing in the event that the sirup boils over. The room is provided with a hose bib and a wall receptical for 110 V circuit.

Room B. The maple cream room. 14' x 5', contains the open trough of running cold water used to chill the sirup prior to beating, the cream beater and the packaging table. This room is also isolated from Room C to prevent raising the humidity by moisture from the open water trough. The cream beater, when of the rotating pan and stationary paddle type, is located adjacent to the packaging table since it is important that the cream be packaged immediately following its removal from the beater.

Room C. The candy making and crystal coating room is the largest of the three since more operations are involved. The room is designed to permit a smooth and efficient flow of operations. See figures 2 and 3.

Candy manufacture. The sirup is cooked to the correct density, or elevation of boiling point, in the steam kettle, Room A. It is transferred to the deep pans and set in cooling trough (Room B) for chilling. When sufficiently cooled it is taken to the candy or fondant machine, where it is stirred to initiate crystal formation. While it is plastic it is run into molds (Table 1) and the filled molds placed on support trays (1/8" hard board), the same size as the mold, and stacked for temporary storage to firm (completing the crystallization) the candies. The molds are then transferred to Tables 2 and 3 where the candies are emptied from the molds onto metal trays (cookie sheets), the candy edges are trimmed, and the broken and imperfectly formed candies are sorted out. The trays of candies are placed on Table 1 and the candies are transferred to the baskets for crystal coating (Fig. 4). Care should be taken not to load the basket higher than the walls so that all of the candies will be covered when the baskets are submerged in the crystallizing sirup. The baskets of candies are placed in the crystallizing sirup about 4:00 P.M. and are removed about 8:30 A.M. the following morning.

The baskets are immediately hung above the crystallizing vat by the hooks suspended from the top of the vat cabinet. They remain in that position until essentially all of the free sirup has drained from them. The baskets are then taken to Tables 2 and 3 and the candies carefully dumped on trays (cookie sheets). The candies

☆ Sirup for Crystal Coating ☆

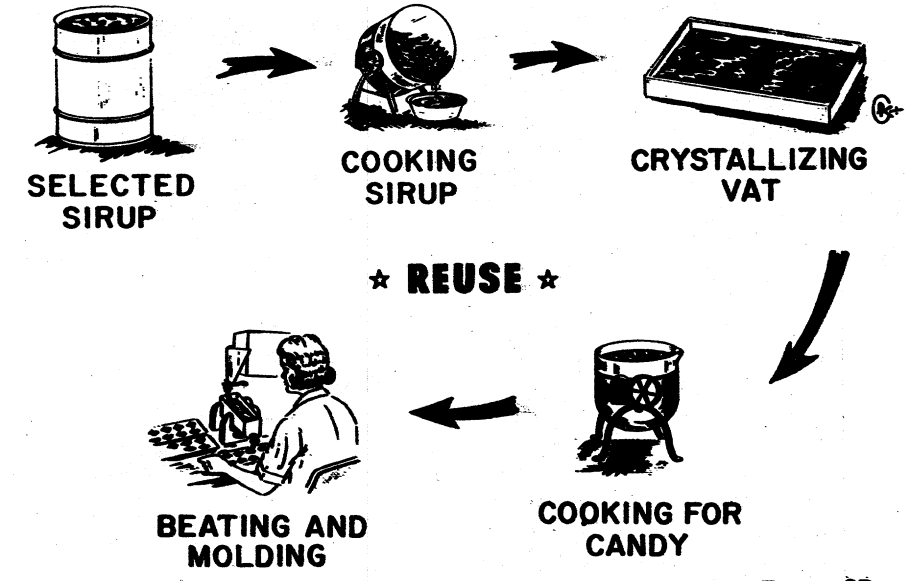


Figure 2B

are then individually wiped by hand with a damp sponge. The wiped, dry candies are then laid flat, one layer thick, on the screen drying trays and placed on the drying racks (Fig. 4) to air dry for 6 to 8 days.

If space permits, the drying rack can be enclosed and a dehumidifier installed to keep the relative humidity below 40. Otherwise, cover the drying racks with cheesecloth and keep Room C at or below 40 relative humidity with an air conditioner and/or with a dehumidifier.

The crystallizing sirup must be made from sirup containing less than 1/2° invert sugar. Usually a first run, extra light fancy sirup

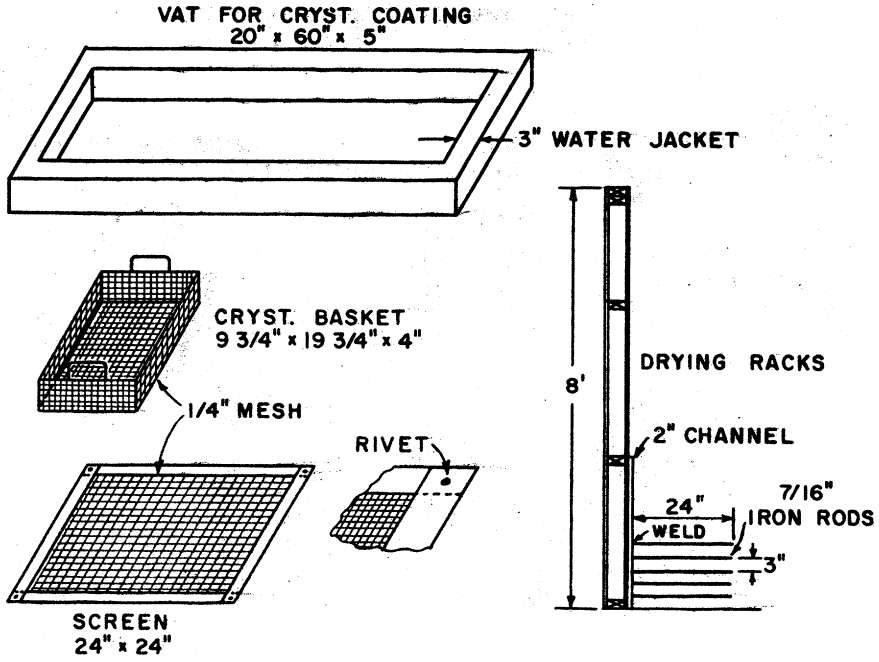


Figure 4

Candy Making and Crystal Coating

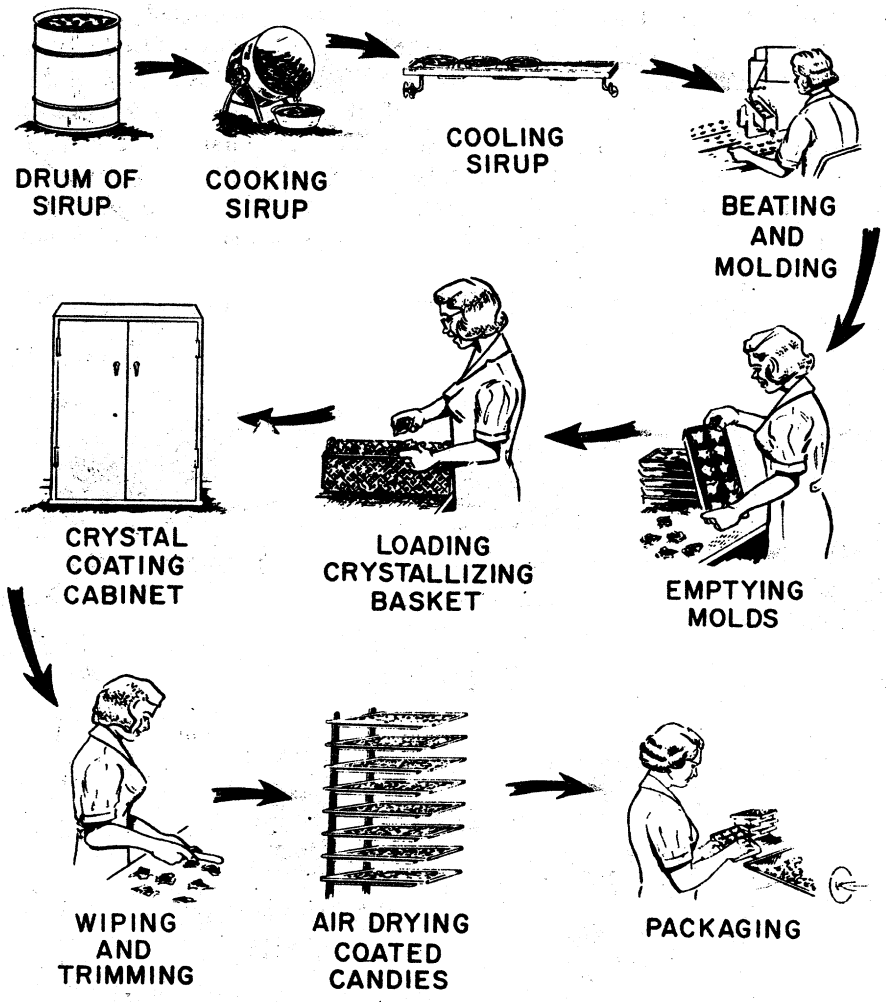


Figure 3

meets this requirement. It is desirable to select at least a drum of this sirup and set it aside for this single use. The sirup is cooked to the correct density or elevation of boiling point (10° - 17° F.) in the steam kettle and transferred immediately to the water jacketed crystallizing vats. If this is done by 10:00 A.M. the sirup will have been cooled to 80° F. by the circulated cold water in the vat jacket to permit placing the baskets of candies in the crystallizing sirup by 4:00 P.M.

The crystallizing sirup is used only once; when it is drained from the crystallizing vats it is combined with the candy making sirups, and a new fresh lot of sirup is withdrawn from the sirup selected and set aside for making the crystallizing sirup.